

New Species of Woody Plants from Amazonian Peru

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ABSTRACT. New species of *Ancistrothyrsus* (Passifloraceae), *Spathelia* (Rutaceae), and *Allophylus* (Sapindaceae) from Amazonian Peru (and adjacent regions) are described and discussed. In addition, a new combination is made to elevate *Allophylus pilosus* to specific rank.

Miscellaneous new species from Amazonian Peru have accumulated in my files over the past decade. Unpublished names for some of these species have been used in the herbarium, but formal publication has been hitherto postponed in hopes of obtaining additional material or more complete field observations. The names are now needed for inclusion in the *Catalogue of the Flowering Plants and Gymnosperms of Peru* (Brako & Zarucchi, in prep.).

PASSIFLORACEAE

Ancistrothyrsus hirtellus A. Gentry, sp. nov.

TYPE: Venezuela. Amazonas: trail S from Cerro Neblina base camp on Río Mawarinuma, from clear water stream to top of first small hills, 150–350 m, 0°50'N, 66°11'W, 3 May 1984 (fr), *Gentry & Stein 47114* (holotype, MO; isotypes, AAU, HUA, MO, NY, VEN). Figure 1.

Frutex scandens, ramulis hirtellis. Folia lamina obovata vel oblongo-elliptica, 7–24 cm longa, 3.5–12 cm lata, infra dense hirtella, supra sparsim hirtella. Inflorescentia axillaris, in cirrhum desinens, ramulis fertilibus lateralibus. Flores albi, sepalis lanceolatis dense puberulis, petalis lanceolatis ca. 2.5 cm longis, staminibus ovarioque in androgynophoro portatis. Capsula 4-valvata, dense puberula.

Canopy liana, the branchlets terete, persistently hirtellous with somewhat crisped trichomes, with axillary tendrils having thickened curved tips. Leaves with blade obovate to oblong-elliptic, rounded at apex, broadly cuneate to rounded at base, 7–24 cm long, 3.5–12 cm wide, densely and persistently hirtellous with erect or suberect trichomes below, also with scattered peltate scales, above conspicuously peltate-lepidote with reddish scales and sparsely hirtellous over surface and more persistently along main veins, the petiole 0.8–1 cm long, adaxially grooved, rather densely pubescent with subappressed-rufescent trichomes, arising from a con-

spicuously raised projection from the branchlet. Inflorescence axillary, the short fertile branches borne laterally near a hooked or coiled apical tendril, the peduncle reddish hirtellous, 4–13 cm long. Flowers white, the sepals lanceolate or lanceolate-elliptic, acute, densely tannish puberulous, ca. 3 cm long, 7–8 mm wide, persistent in fruit, the petals lanceolate, ca. 2.5 cm long, the ovary and gynophore encircled by a corona formed from a ring of filamentous staminodia basally fused and densely pubescent, the stamens with filaments arising from base of ovary at apex of ca. 4-mm-long androgynophore, at least 6 mm long (anthers and filament apex eaten in only mature flowers examined), the anthers in bud 1.5–2 mm long, dorsifixed, not apiculate, the ovary ovoid, densely villous, topped by four slender style branches. Capsule yellow at maturity, 4-valved, ellipsoid, acute at apex, conspicuously stipitate at base, 6–9 cm long, 3.5–4 cm wide, the stipe 1–2 cm long, densely tannish puberulous with both short crisped hairs and longer suberect ones as well as numerous reddish peltate glands, the valves woody but fragile, ca. 3 mm thick, pulp completely lacking, the seeds 12–14 mm long, 1 mm wide, borne 2–5 together along the midline of each valve, flattened and obovate with a shallowly pitted surface, not arillate.

Distribution. Poor soil terra firme areas of central and northwestern Amazonia, below 200 m.

Paratypes. VENEZUELA. AMAZONAS: Cerro Neblina base camp, Río Mawarinuma, 0°50'N, 66°11'W, mature forest on sandy “ultisol” and along clear water stream, 140 m, 2 May 1984, *Gentry & Stein 47103* (MO, VEN). PERU. LORETO: Prov. Loreto, Dept. Tigre, Río Corrientes, Shiyiyacu, camino a Forestales (38 km), 25 Nov. 1979 (fl, fr), *Ayala 2334* (AMAZ, MO). BRAZIL. AMAZONAS: Estrada do Rais, silva secundaria non inundabili, 23 Nov. 1936 (fl), *Ducke 290* (NY); Igarapé do Binda, terra firme, solo argiloso, mata virgem, *Rodrigues & Chagas 4074* (INPA 10639) (NY).

This species is not uncommon in the vicinity of the Cerro Neblina base camp, as judged by fallen fruits in three different places along the limited trail system explored. All plants were canopy lianas growing in tangles of other lianas in the top of a canopy tree and invisible from the ground. We were only able to locate the leaves and attached fruits of the

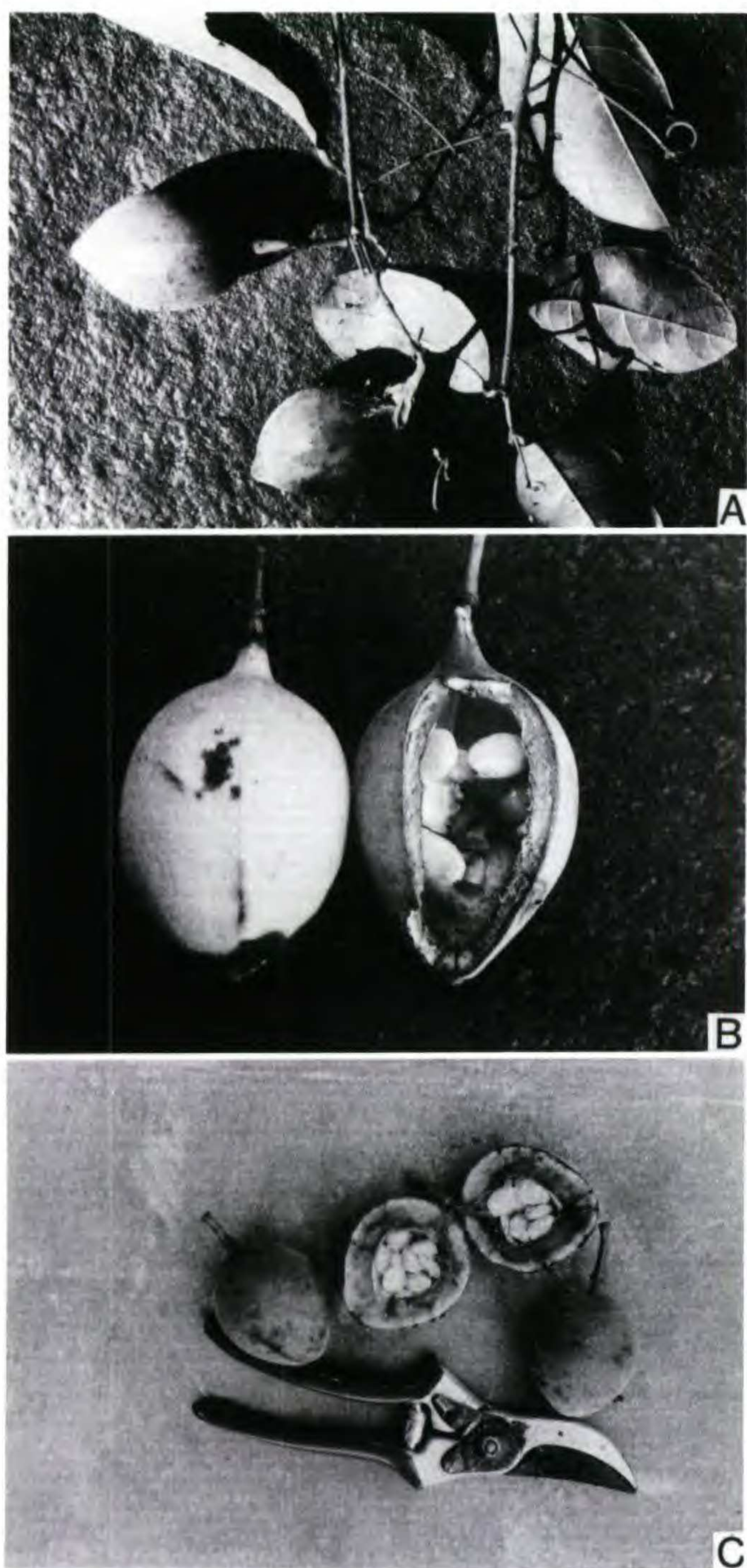


Figure 1. *Ancistrothyrsus* fruits. A, B. *A. hirtellus* (Gentry & Stein 47114). —A. Habit. —B. Fruit, close up. —C. *A. tessmannii* (Gentry et al. 55911, from Indiana, Loreto, Peru). Shears are 21 cm long.

type, recognized in the field as a new species, after climbing several nearby trees.

The hitherto monotypic genus *Ancistrothyrsus* Harms, previously known only from a few collections from Peru and Brazil, is of unusual phylogenetic and phytogeographic interest. *Ancistrothyrsus* is the only neotropical representative of the otherwise palaeotropical, mostly African, tribe Paropsieae, with features intermediate between Flacourtiaceae and Passifloraceae (DeWilde, 1971). Moreover, *Ancistrothyrsus* is the only climbing member of Paropsieae, and is closer to Passifloraceae sensu stricto, with which it shares such unusual characters as

tendrill-bearing inflorescences, than is any other member of Paropsieae. *Ancistrothyrsus* was described in Flacourtiaceae and is retained under that family in most herbaria and in the *Flora of Peru* (Macbride, 1941), although modern African floristic authors (e.g., DeWilde, 1975; Fernandes & Fernandes, 1978) generally treat the tribe Paropsieae under Passifloraceae. DeWilde (1971) has shown convincingly that *Ancistrothyrsus*, too, is best treated under that family, a conclusion accepted by Keating (1973) and Sleumer (1980).

Examined Peruvian material of *A. tessmannii* Harms (including an isotype, *Tessmann 4479* (NY)), differs conspicuously from the plant described above in having the mature leaves uniformly glabrous, except for the lepidote glands. Juvenile leaves have short, appressed hairs different in form from the much longer, erect ones of *A. hirtellus*.

The mature fruit of *A. tessmannii* (and thus of the genus) has never been described. Harms (1931) merely noted in the original description that juvenile fruits are subglobose and densely hirsute. The mature fruit is globose or depressed-globose, 4–9 cm long, 4–8 cm in diameter, densely and finely tannish puberulous, with the pericarp 3–4 mm thick. The seeds are flattened-obovoid, 1–1.5 cm long, and 0.9–1 cm wide. Thus the fruit of *A. tessmannii* is quite different from that described here for *A. hirtellus*, which differs in being much narrower and more ellipsoid with a more acute apex, a longer basal stipe, and more strongly tomentose valves. There is no doubt that these very different fruits belong to different species.

Interpretation of the limited available floral material is more problematic. DeWilde (1971) studied three collections, one in fruit and two in flower. He emphasized that the two flowering collections, *Ducke 24385* and *35681* (neither of which I have examined), had very different flowers, differing in flower size and in apiculate versus nonapiculate anthers. The large-flowered specimen (*Ducke 24385*) had tepals ca. 4 cm long and nonapiculate anthers; the small-flowered specimen (*Ducke 35681*) had tepals less than 2 cm long and long-apiculate anthers. It would be tempting to suppose that these two flower morphs correlate with the two different species recognized here, except that a single stamen of the two flowers of *Klug 650* and *Ducke 639* each has a long, conspicuous apicule, while the remainder of the stamens of these flowers are nonapiculate.

DeWilde gave no indication of what other features correlate with his two flower types. However, since both the glabrous-leaved collections here referred to *A. tessmannii* and the pubescent-leaved ones referred to *A. hirtellus* have large tepals, flower size

may not be a useful differentiating character. One of the collections cited above, *Rodrigues & Chaves 4074*, is not included in the description of *A. hirtellus*. It is dramatically different from all other material examined in the 3–4-mm-long trichomes that are interspersed with the normal reddish hirtellous ones on its branchlets. These long trichomes have short, reddish lateral branches and resemble miniature bottle-brushes. The examined duplicate of the Rodrigues collection has only buds, but if *Ducke 35681*, the small-flowered specimen with apiculate anthers illustrated by DeWilde, should prove to share this unusual pubescence, these two collections would merit specific recognition.

The two *Ancistrothyrsus* species are apparently allopatric, but they are rarely collected and their geographical distributions are not entirely clear. All but one of the thirteen Peruvian *Ancistrothyrsus* collections examined belong to *A. tessmannii*, including material from Loreto, Amazonas, and San Martín departments. Both species also occur in Brazil: *Ducke 639* (MO, NY), from São Paulo de Olivença near the Colombian border, is typical glabrous-leaved *A. tessmannii*, but *Ducke 290* (NY), from near Manaus, is *A. hirtellus*. One of the specimens illustrated by DeWilde (1971) (*Ducke 24384*, provenance not indicated) has ellipsoid stipitate fruits and hirtellous branchlets and would seem referable to *A. hirtellus*. Since the two flowering collections examined by DeWilde had very different floral morphologies, it is possible that his two flower morphs correspond to the two different species of *Ancistrothyrsus*. Apparently, *A. hirtellus* is restricted to the poor soil area of central and northwest Amazonia, while *A. tessmannii* occurs in the lateritic soil areas of the Solimoes and Peruvian Amazonia. In the Iquitos area I have seen *A. tessmannii* only in mature forests on relatively fertile soils.

RUTACEAE

Spathelia terminalioides A. Gentry, sp. nov.

TYPE: Peru. Loreto: Mishana, Río Nanay half-way between Iquitos and Santa Maria de Nanay, 140 m, mature forest on upland white sand near Campamento Uno, 73°30'W, 3°50'S, 25 Feb. 1981 (fl, fr), *Gentry et al. 31751* (holotype, MO; isotypes, AMAZ, USM). Figure 2.

Arbor eramosa. Folia pinnata, rhachidi in quoque latere foliolos 14–39 vel ultra gerenti, foliolis alternis, oblongo-lanceolatis, acutis, 2–19 cm longis, 0.6–4 cm latis, glabris. Inflorescentia terminalis, late paniculata. Flores feminei albi, sepalis ovatis 1 mm longis puberulis, petalis ellipticis 3–4 mm longis, staminodiis 1.5–2 mm longis filamentis alatis, ovario complanato orbiculato. Fructus

planus, 2-alatus, transverse oblongus, 1.4–2 cm longus, 3–4 cm latus.

Tree ca. 30 m, unbranched, slender, with a terminal cluster of large pinnate leaves surrounding the large paniculate terminal inflorescence. Leaves multifoliolate (14–39+ leaflets (or leaflet scars) per side), the leaflets alternate, entire, oblong-lanceolate, asymmetrically obtuse at base, acute at apex, 2–19 cm long, 0.6–4 cm wide, with scattered glandular punctations, glabrous except for minute trichomes on the petiole and petiolules, at base of midvein above, and very sparsely scattered over lower surface when young, the petiole slightly flattened to strongly grooved above, flattened at base (the enlarged petiole base to at least 3.5 cm across) and forming conspicuous ridges on stem. Inflorescence large, openly paniculate, minutely puberulous, the bracts virtually absent, mostly reduced to tiny triangular flaps of tissue, the pedicels slender, minutely puberulous, 3–7 mm long. Flowers (only female seen) white, the sepals ovate, obtuse, ca. 1 mm long and wide, somewhat puberulous; petals elliptic, 3–4 mm long, rounded at tip, glabrous, staminodes 1.5–2 mm long, flat and incurved, the basal part of filaments strongly winged, the wing bilobed at tip, villous adaxially; pistil with the ovary flattened and orbicular, ca. 3 mm long, glabrous except the puberulous, thickened, 1-mm-long basal gynophore, the stigma sessile. Fruit flat, broadly 2-winged, transversely oblong and much broader than long, 1.4–2 cm long, 3–4 cm wide (narrower and rhombic when immature before the wings have expanded), glabrous, the central seed-bearing portion somewhat swollen, completely surrounded by the wing, heart-shaped if with 2 seeds or tear-drop-shaped if with one.

Distribution. Known only from the type collection from an ecologically distinctive area of white sand forest on the Río Nanay near Iquitos, Peru.

This wing-fruited genus is not typical of Rutaceae, and at first I thought the Peruvian plant might represent a new genus of Sapindaceae. Instead, this tree turns out to belong to a mostly West Indian genus otherwise known in South America only from the Guayana Shield area and central Amazonia. Most of the South American species are locally endemic, small trees of the tepui summits (Cowan & Brizicky, 1960).

Most of the West Indian species are quite different from *Spathelia terminalioides*, with narrower, 3-winged, fruits, while the Guayana Highland material I examined is similarly 2-winged but with wings that are thicker and less developed. There is also a single lowland Amazonian species, *S. excelsa*

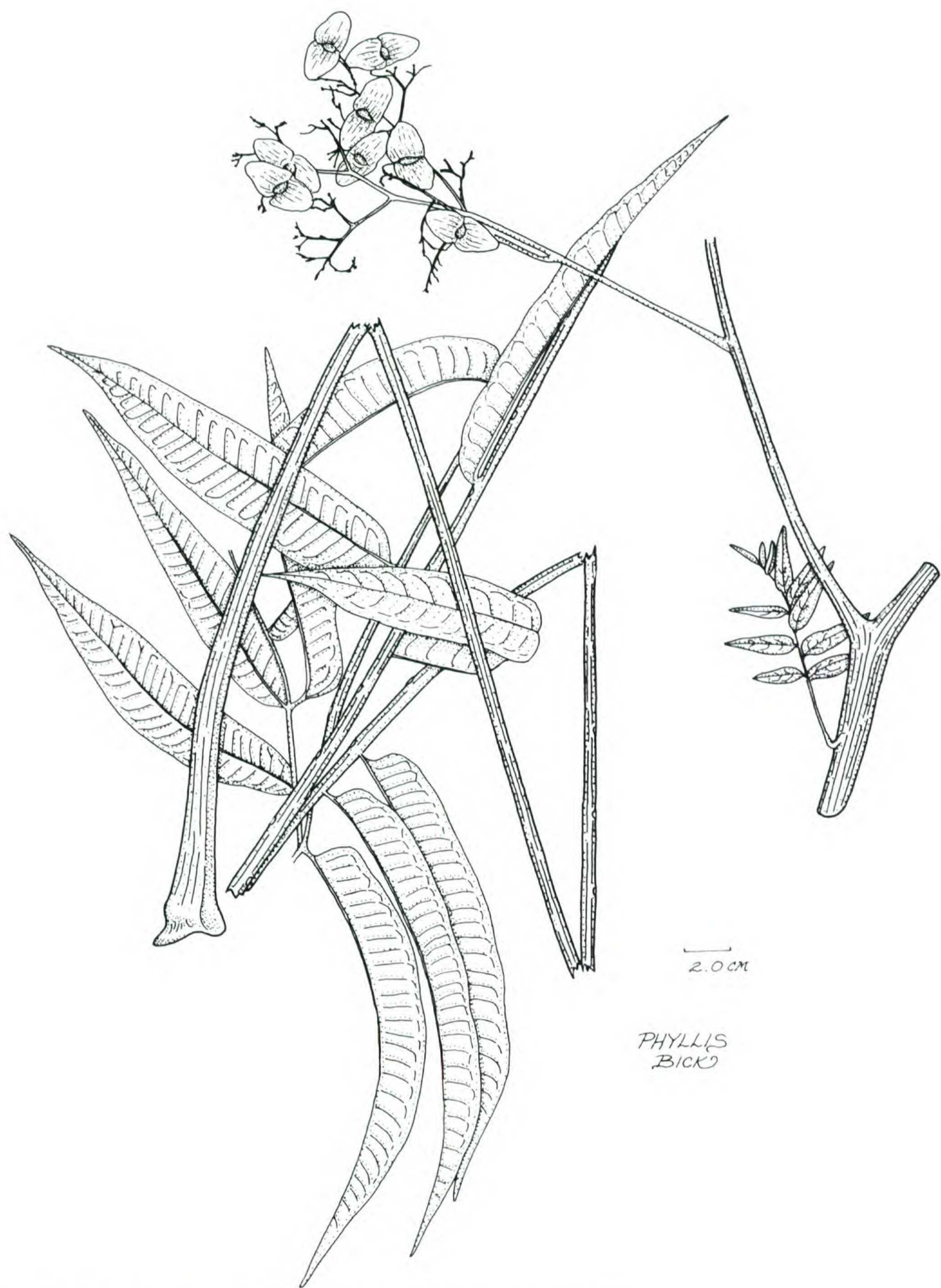


Figure 2. *Spathelia terminalioides* A. Gentry (Gentry et al. 31751, MO).

(K. Krause) R. Cowan & Briz., which is the nearest relative of the Peruvian species. That species is known only from a few collections from central Amazonian Brazil (Albuquerque, 1977). *Spathelia excelsa* differs from *S. terminalioides* in having a

tannish villous inflorescence and in larger (2.5–3.5 × 4.5–6 cm) fruits with differently shaped wings. The fruit wings of *S. terminalioides* are somewhat triangular in outline, with relatively narrow tips and a straight ventral margin, while *S. excelsa* has more

rounded wing apices and a prominently cordate ventral margin. The fruits of *S. terminalioides* are similar in form to those of such *Terminalia* species as *T. obovata* (Ruíz & Pavón) Steudel, hence the specific epithet.

The area in which *S. terminalioides* was discovered has white sand soil and many disjuncts from the upper Río Negro area, where similar soils predominate. Thus the discovery of a Guayana genus halfway across South America from its previously known range is perhaps not as surprising as it might seem at first.

SAPINDACEAE

Allophylus multicostatus A. Gentry, sp. nov.

TYPE: Peru. Amazonas: Aintami Creek, Río Cenepa, 550 ft., 24 Nov. 1972 (fl), *Berlin 346* (holotype, MO; duplicates distributed as *A. divaricatus* Radlk.).

Arbor 5–15 m alta. Folia 3-foliolata, foliolis ellipticis vel obovato-ellipticis, plus minusve serrulatis, puberulis praecipue secus venas. Inflorescentia axillaris, pyramido-paniculata, tomentosa, pedicellis minus quam 1 mm longis. Flores ca. 1 mm longi, plus minusve albi, sepalis suborbiculatis, puberulis, petalis ca. 1 mm longis, staminibus fertilibus 6–7, exsertis. Fructus ellipsoideus vel globosus, 8–9 mm longus, 7–9 mm latus, sparsim puberulus.

Tree 5–15 m tall, with sparsely puberulous and reddish punctate branchlets. Leaves 3-foliolate, the leaflets with blade elliptic to obovate-elliptic, acute to short-acuminate, broadly cuneate to obtuse at base, 7–25 cm long, 3.5–12 cm wide, firmly membranaceous, the margin serrulate to shallowly serrate or essentially entire, sparsely puberulous mostly along veins below and along midvein above, with 12–23 secondary veins on a side, these rather straight and parallel, the petiole 3.5–12 cm long, sparsely to conspicuously tannish tomentose. Inflorescence axillary, openly pyramidal-paniculate with at least the lowermost of the generally 5–9 primary lateral branches several-branched, tannish tomentose in flower, partially glabrescent in fruit, mostly over 15 cm long; pedicels < 1 mm long. Flowers ca. 1 mm long, whitish to greenish, the suborbicular sepals somewhat appressed-puberulous, the petals ca. 1 mm long, glabrous except the inconspicuously ciliate margins, the 6–7 fertile stamens exserted almost 1 mm beyond perianth, the anthers short. Fruits broadly ellipsoid to globose, greenish yellow (mature?), ca. 8–9 mm long, 7–9 mm diam., sparsely and inconspicuously appressed-puberulous.

Distribution. Lowland Amazonian Peru (and probably adjacent Ecuador).

Paratypes. PERU. AMAZONAS: Río Cenepa region, *Berlin 309, 346, Tunqui 204, Kayap 115, Huashikat 1473* (all MO).

Local names. “Suhi knum” (*Berlin 309, 346*), “tsanignum” (*Tunqui 204*), “jimagma” (*Kayap 115*: probably confused with sympatric *A. floribundus*, for which this name is usually used), “wayu” (*Huashikat 1473*).

The most noteworthy features of this plant are its large, open, much-branched panicles and the relatively close together and straight secondary venation of its usually large and dark-drying leaflets. Following Radlkofer (1900, 1932), this species keys to *Allophylus paniculatus* because of the well-developed paniculate inflorescence with branched lateral branches, but it differs from that species in the puberulous tomentum of twigs, leaves, and inflorescence. If the inflorescence is taken as merely 3–6-branched, *A. multicostatus* keys to *A. divaricatus* and *A. cinnamomeus*. In addition to the unbranched inflorescence branches, *A. divaricatus* differs from *A. multicostatus* in densely and conspicuously tannish-puberulous petioles and leaf undersides (especially the main veins), and in having generally more membranaceous leaflets with the terminal one tapering gradually to the base and distinctly differing in shape from the smaller laterals; *A. cinnamomeus* differs in its smaller, sharply serrulate leaflets and much larger (3 mm wide) flowers.

Using the *Flora of Peru* (Macbride, 1956), *Allophylus multicostatus* keys to *A. divaricatus* because of its 3-foliolate leaves and laxly branched inflorescence. However, the usually larger leaves distinguish *A. multicostatus* from that species; large-leaved specimens have the largest leaflets of any Peruvian *Allophylus*. The smaller (maximum 9 cm wide) leaves of *A. divaricatus* also dry a different color (\pm olive below vs. brownish to blackish brown in *A. multicostatus*) and mostly have fewer secondary veins (10–13(–15) vs. 12–23). Another difference is in the fruits; the only fruiting collection I have examined of *A. divaricatus* has smaller, densely puberulous fruits, which are very different from the large, glabrescent ones of *A. multicostatus*.

The only neotropical species published since Macbride (1956) are Bolivian *Allophylus steinbachii* F. Barkley and several Cuban species. I have not compared this species with the Cuban or palaeotropical taxa, which I assume are different on phylogeographic grounds.

Two collections with somewhat smaller leaves and inflorescences and entire leaflet margins are included in this circumscription and description because of the otherwise similar aspect and branching of the basal inflorescence branches.

Allophylus pilosus (J. F. Macbr.) A. Gentry, comb. et stat. nov. *Allophylus semidentatus* (Miq.) Radlk. var. *pilosus* J. F. Macbr., Field Mus. Nat. Hist., Bot. Ser. 13: 376. 1956. TYPE: Peru. San Martín: Juan Jui, Río Huallaga, 400 m, tree 6 m, flowers white, Klug 3783 (holotype, F; isotype, MO).

Small tree 3–10 (–20) m tall with rufous pilose twigs, the trichomes 1–2 mm long. Leaves 3-foliolate, the leaflets petiolulate, obovate (terminal) or asymmetrically oblong-elliptic (laterals), 6–30 cm long, 2.5–13 cm wide, membranaceous, the margin serrate, densely pubescent below; petiole 5–26 cm long, conspicuously rufous pilose. Inflorescence simply racemose, densely rufous pilose. Flowers ca. 2 mm across, the petals and sepals ca. 1.5 mm long. Fruits ellipsoid, pilose, 10–13 mm long, 6–10 mm wide, orange at maturity.

Additional specimens examined. ECUADOR. NAPO: near Río San Miguel, 21.2 km N of Lago Agrio, 470 m, 0°8'N, 76°50'W, (shrub, flowers in bud), Croat 50363 (MO). PERU. AMAZONAS: Río Santiago, Quebrada Caterpiza, 200 m, 77°40'W, 3°50'S, (árbol 3 m, frutos verdes), Tunqui 642 (MO), (árbol 4 m, frutos verdes), Tunqui 978 (MO), (árbol 4 m, flores H-4), Huashikat 584 (MO), Huashikat 1657 (MO). HUANUCO: Bosque Nacional de Iparia, 1 km arriba del pueblo de Tournavista, Prov. Pachitea, 300–400 m, J. Schunke V. 17867 (MO). LORETO: Quebrada Yanomono, Explorama tourist camp, ca. 72°48'W, 3°28'S, 120–130 m, (tree 10 m tall, 2" D.B.H., fruits green), Gentry et al. 27846 (AMAZ, MO), (tree 4 m, fruits orangish), Gentry et al. 29065 (AMAZ, MO), (árbol 20 m, frutos verdes y marrones, pubescentes), Díaz et al. 1184 (AMAZ, MO). MADRE DE DIOS: Tambopata, tropical moist forest on alluvial soil along Río Tambopata, 280 m, 12°49'S, 89°18'W, Gentry et al. 45750 (MO). UCAYALI: Provincia Coronel Portillo, Río Abujao, Quebrada Shesha, 73°45'W, 8°20'S, Díaz et al. 830 (AMAZ, MO).

Local name. "Tsanignum" (Aguaruna).

In his *Flora of Peru* Sapindaceae treatment, Macbride (1956) referred only one specimen to *A. semidentatus* (Miq.) Radlk., the pilose Klug specimen that he designated as the type of variety *pilosus*. Macbride noted that Standley had originally proposed the unpublished name *A. pilosus* for the Klug collection, but "since ex char. it seems too near *A. semidentatus*, I propose it myself as merely a variant"

Recent Peruvian material collected by the Flora of Peru project includes not only the above-cited 11 additional specimens of this taxon with distinc-

tive, conspicuously rufous-pilose indumentum, but also nine collections of the real *A. semidentatus*, characterized by a short puberulous indumentum. The two taxa prove consistently distinct. In addition to the different indumentum, *A. semidentatus* has much smaller, narrower leaflets with a less pronounced reticulation of tertiary venation below, smaller, glabrous fruits, and a more slender inflorescence axis. Its leaves usually dry a different darker color both above and below than do those of *A. pilosus*, and the inflorescences tend to branch near the base, whereas those of *A. pilosus* are uniformly simple racemes.

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